BIBLIOGRAPHICAL NOTICES.

Art. XI.—*On the Construction and Management of Hospitals for the Insane; with a particular notice of the Institution of Siegburg.* By Dr. Maximilian Jacobi. Translated by John Kitching. With Introductory Observations, &c., by Samuel Tuke, London, 1841, pp. 380.

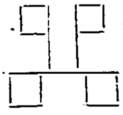
In the progress of the amelioration of the condition of the Insane, and of improvement in the method of their treatment, a corresponding advancement was absolutely necessary in the construction, organization, internal arrangement and general economy of the establishments devoted to this unfortunate class of our fellow-men. Among those who have written upon this subject, and whose works are already known in this country, Samuel Tuke and Sir William Ellis, of England, and Drs. Brierre, of Boismont, and Esquirol of France, stand pre-eminent. We have before us another work upon the same subject, evidently written by one to whom that subject was perfectly familiar, and who combines, in his constitution, a sound judgment with a benevolent and philanthropic heart.

Dr. Jacobi, superintendant of the Asylum for the Insane at Siegburg, for the Prussian Provinces on the Rhine, to use the language of the "Introductory Observations," "is well known in England, as well as on the continent of Europe, as a man of talents and attainments of no common order." These qualifications combined with an experience of many years, render his opinions worthy of consideration and respect. The English translation, the title-page of which is quoted at the head of this article, is prefaced by comments upon some portions of the work, and observations upon other subjects connected with Insanity. This preface, or introduction, written by Samuel Tuke, extends to about eighty pages, and is fraught with useful *matériel*, the result of long devotion to the study of mental diseases and the most judicious method of their treatment.

Dr. Jacobi commences with a discussion of the proposition, whether it be best for the insane, that they be kept under treatment at home, or removed to an institution designed for their accommodation. He concludes, that "isolation and removal from all accustomed habits and connexions form, nearly always, the first and indispensable condition of recovery." In an appended note, the editor remarks that "this sound general rule has its exceptions." The objections which have been raised to public asylums are answered, and the numerous advantages of such establishments portrayed. The leading principles to be followed in the construction of asylums are laid down, having the great objects in view, the safety, comfort and restoration of the patients. The object of Dr. Jacobi is, to present a model for a *curative* institution. Hence, he would reject all congenital idiots and those who, becoming imbecile or fatuitous after birth, have remained so during a series of years; those suffering from epilepsy supervening on prolonged insanity; maniacs and the demented, whose present disorder has succeeded epilepsy; the senile insane; and some others. He would limit the number of patients to two hundred; admit none in whom the disease is of longer duration than three months, and restrict the term of treatment, and of residence in the asylum, to two years. He would prefer that the two sexes should be placed in entirely distinct establishments,—an opinion in which the editor does not coincide.

After having enumerated the several requisites to a good site for a lunatic asylum, the author proceeds to notice the advantages and disadvantages of the plans of several of the most approved of actually existing institutions. These are, 1st, Esquirol's plan of several quadrangles but one story in height; as at the private establishment of Esquirol, at Ivry, near Paris; the asylum at Rouen, and the most recently constructed portions of that at Charenton. 2d, The H form,—that of the Asylum at Wakefield, England; 3d, The lineal form; under this head he refers particularly to the Sachsenberg Asylum, and the new Bethlehem Hospital, of London. The great objection to this form, is the necessity for several *stories*, in order to sufficiently concentrate a large number of patients. 4th, The star, or radiating form,—that of the asylum at Glasgow, and of many penitentiaries. Both Jacobi and Tuke condemn this model for asylums for the insane. 5th, The plan of the Middlesex Asylum, at Hanwell, England, and that of a private one near Paris. In the former, the author says there are no means for a satisfactory classification of the patients. 6th, that of distinct pavilions. To all these forms objections are raised, but the editor appears fully to approve of that of the Wakefield Asylum.

The principles forming the basis of the internal arrangement of the buildings, are considered, among the principal of which is, a proper classification of the patients according to the several types of the disease. Five classes are recommended in the work, but we are informed by the editor, that the author had subsequently changed his opinion and proposed seven classes, as follows:—"1st, The raving and violent patients; 2d, The noisy, whatever may be the kind of their insanity; 3d, The dirty, unbridled patients, or those sunk in a deep state of sexual excitement; with whom the depraved idiotic and stupid may be associated, if at all admitted into the establishment; 4th, Those whose propensities and habits make them hurtful companions; 5th, The melancholy and suicidally inclined; 6th, The quiet and decently behaved; 7th, The convalescent." In his remarks upon this subject, the author objects to the removal of patients from their accustomed class, immediately after convalescence, and placing them in one consisting exclusively of those who are nearly or absolutely restored to health. "Convalescents," says he, "attain perfect restoration, when exclusively surrounded by the worst patients of all kinds, and I have never seen either a relapse or any essential harm occasioned purely by such influence." Furthermore, the presence and demeanor of these, is of such decided advantage to those in whom the disease is still unyielding, that removal occasions serious detriment on the part of the latter, unattended by a corresponding benefit to the former. The model described by the author consists of two quadrangular buildings, one for either sex, each two stories in height, surrounding a court, and connected with each other by an intermediate building, in which are the offices and the domestic rooms for the accommodation of the officers. From this intermediate building, two covered alleys, separated by a yard, extend 150 feet in the rear, each terminating in a quadrangular building similar to those aforementioned, though smaller, and but one story in height. These are for the noisy and violent patients of the two sexes. They also contain the bath-room and wash-room. The model may be more readily comprehended from the following figure.



The establishment of which this is the general form, is described with remarkable accuracy and minuteness of detail, which extends not to the plan and materials of construction of the rooms, the apparatus for warming and lighting, alone, but to the bath, water-closets, besteads, furniture, table-service, doors, latches and locks. Indeed, no appurtenance, however small, has escaped notice. With equal precision and regard for minutiæ, are described the arrangements, apparatus and all other means for the medical and moral treatment of the patients. Besides the more direct remedial agents, the cold, warm and shower-baths, affusion by the douche, electricity, and rotary motion in the "revolving chair," are recommended; for the confinement of refractory patients, muffs, mits, masks for those who bite or gnaw their clothes, the strait-jacket, the tranquillizing chair, and straps for fastening into bed at night. In regard to the strait-jacket, the use of which is now almost entirely abolished in the British and American asylums, the editor remarks, "In the hands of judicious persons, the strait-waistcoat is a valuable apparatus; but in the hands of another class—rash, ignorant and injudicious, (and who knows not how many of this class fill the office of attendant!)—it is liable, from the two tight drawing of the ligatures, to be an instrument of great torture. I speak here of what I have seen; there can be no doubt that the body-belt, with straps attached to the arms is, whenever it will answer the purpose, a decidedly preferable mode of restraint."

Manual labour, and particularly that of the garden or field, is very highly recommended. "By far the greater number of these occupations," says the author, "may be looked upon as especially powerful restoratives; partly from their own intrinsic virtues, and partly as co-operating with other sanative measures." For calming and strengthening the mental powers, reading, writing, arithmetic, geography, philosophy and the higher mathematics are proposed. As an additional means in the moral treatment, it is remarked that, "music, from the deep and varied effects which it is capable of producing upon the mind, promises to become a powerful, though it has hitherto been a sadly too much neglected, means in the treatment of mental derangement." The hand organ is considered the most appropriate instrument, as requiring no specific skill in the performance upon it. Occasional dancing is also approved of. In regard to religious services, Dr. Jacobi says, "it has been invariably found, in all those lunatic asylums where a regular system of divine service has been introduced, that its general effects upon the minds of the patients, and even of those who may be anything but keenly sensible to religious impressions, are of a tranquillizing and alleviating character."

The diet of the sick, the general regimen, and the duties of officers and attendants are elaborately described. Then follows a minute account of the Siegburg Asylum, which differs but little from the model establishment with which the preceding portion of the book is occupied. Among those who are not admitted into the Siegburg institution, are, besides the classes already mentioned, those who labour under cancer, syphilis, or any other affection requiring treatment inconsistent with the specific object of that asylum. It appears to be a remarkably well organized establishment, and is conducted with a vigour and energy which might well be imitated in every institution of the kind. The number of officers and attendants is very large in proportion to that of patients. There are three resident medical officers, two clergymen, one protestant the other catholic; two stewards, and three "superior attendants," who hold a rank intermediate between that of the other officers and the attendants. There is one attendant for every eighth patient. It is expected that the clergymen, aside from their regular duties of religious service and occasional attendance on the sick, will "seek acquaintance with every one, penetrate into the hidden character, and minister incidentally or directly, to the intellectual, moral and religious wants of the patients."

In his introduction, the editor raises some objections to the model proposed by Dr. Jacobi; advocates the division of patients into small classes; gives a history of the manual labour system in lunatic asylums; alludes to, and discusses the merits of the proposition of entire abolition of bodily restraint in the treatment of the insane. "The very important experiments," says he, "commenced at Lincoln and now carrying on at Hanwell, have not yet, I venture to say, quite determined the question in the affirmative." Under the head of "Statistics," it is remarked that "insanity prevails in England and Wales, in the proportion of at least one in every five hundred of its inhabitants;" that in the York Poor Law Union, which includes an area of about 266 square miles, and contains a population of 38,564 persons, there is "a proportion of one in 430 of the whole population who are in a state of insanity or idiotism;" and that "in Norway alone, among continental nations, has there been anything like a strict and general inquiry as to the number of insane persons within their bounds. The result of the inquiry, in Norway, is, a proportion of one insane person to every five hundred of the population.

The work of Dr. Jacobi is admirably adapted to the wants of this country at the present time, and ought to be consulted by every Board of Commissioners, or other officers, entrusted with the care of the erection of a lunatic asylum. For the many valuable hints by Dr. Jacobi, and for others by the editor, it should find a place in the library of every physician connected with such asylums, or who is charged with the treatment of the insane. P. E.

ART. XII.—*On the Physical Alterations of the Blood and Animal Fluids in Disease;* being the substance of a series of Lectures delivered at the Faculty of Medicine, Paris. By Prof. ANDRAL. (Reported by M. MONNERET in Gazette Médicale de Paris. No. 51, 1840, and Nos. 5, 9, 19, 28, and 37, 1841.)*

AMONG the subjects at present undergoing investigation in our science, there is no one of higher importance to pathology, and probably to therapeutics also, than that regarding the changes which take place in the animal fluids in disease. It would be a work of supererogation, at the present day, to attempt seriously to show that these fluids are really altered in many diseases, since we believe no physician who has kept pace with the progress of science, now denies this to be the fact. Common sense would indeed lead us to infer that where the organs which elaborate the blood are deranged, their product *must* also be affected; and modern analytical chemistry has actually demonstrated such changes to occur, and also detected in the blood various extraneous substances.

Entertaining these views, we are persuaded that we cannot do our readers a greater service than to furnish them with an abstract of the interesting lectures of M. Andral, which exhibit the existing state of our knowledge on the subject we are considering.

Physiological Condition of the Blood.—After noticing the three species of animal fluids, viz. 1st, those which enter into the composition of the blood, (chyme, chyle, &c.); 2d, the blood itself; 3d, the fluids which are produced from the blood; M. Andral very properly proceeds to determine what is the normal condition of the blood, for without this be first fixed, it is impossible to ascertain the alterations it undergoes.

There are three modes in which we may study the normal or healthy condition of the blood. 1st, With the naked eye, which enables us to detect several physical properties of great importance. 2d, With the microscope. 3d, By chemical analysis.

"The most simple idea that we can form of blood, while circulating through the vessels, is to regard it as an aqueous fluid conveying certain inorganic substances, and an organic substance, which puts on three distinct forms in blood removed from the body. We first have an animal substance, which has the property of coagulation, or, in other words, of separating itself from the aqueous vehicle; this is called fibrin. This coagulation always takes place in blood when abstracted from the body; in some cases it occurs in the vessels, during life, under the influence of certain morbid causes.

"The second animal substance remains always dissolved both in the blood which circulates, and that removed from the body: we call this albumen. The third substance is peculiar to the blood; it is not in a state of solution, but merely suspended in the fluid; it presents itself under the form of small, lenticular corpuscles, which are denominated globules; the diameter of each globule is 1-125th of a millimetre.†

"The blood globules are readily distinguished from the fibrin and albumen by their form and colour; they are composed of two distinct substances; one, called *hæmatosine*, gives to the blood its red colour; the nature of the other substance is not, as yet, clearly determined; some regard it as albumen, others as fibrin.

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* Reported also in the Provincial Med. & Surg. Journal. In our quotations we shall make use of this translation.

† The millimetre is 0.443 of a line.

"The inorganic constituents of the blood are the various salts which are dissolved in the aqueous menstruum; these constitute the solid materials of the serum. If we remove any quantity of blood from a vein, and leave it at rest in a vessel, it soon separates into two parts, which are quite distinct, both as to their physical and chemical properties.

"The first is the clot, or *cruor sanguinis:* the clot is composed, 1st, of fibrin, or the coagulating portion of the blood; 2d, of the blood globules; 3d, of a large quantity of serum entangled in the meshes of the fibrin, which thus retains it, as a sponge would. The second portion of the blood is composed entirely of serum, holding in solution certain salts and the albumen. Instead of allowing the blood to coagulate of its own accord, we may beat it up with a small rod, as soon as it has been extracted from the vein; a quantity of solid matter or fibrin is soon deposited round the rod; the fibrin is thus obtained quite pure, and is separated from the colouring matter, the salts, and albumen, by being frequently washed with water. After the removal of the fibrin there remains a reddish-coloured fluid, composed of the serum, holding the blood globules and the albumen in solution. The spontaneous separation of the globules, and their presence in the serum, show that they are completely independent of the fibrin; they retain, still, all their properties.

"When we examine the blood under the microscope, we perceive nothing except a quantity of serum containing blood-globules; the albumen and fibrin are in a state of solution, and cannot be seen. It will presently be shown that we can derive some useful knowledge concerning the real and apparent size of the clot from these circumstances.

"We have now to examine, more minutely, the intimate composition of the blood. In a physiological point of view, the three organic principles of the blood present several striking differences. Some authors uphold that fibrin is a mere modification of albumen, and this opinion is based on the great difficulty of distinguishing between dissolved albumen and fibrin, or between coagulated fibrin and albumen. But the medical man need not stop to consider these nice distinctions; for, although it might be difficult to determine the distinctive chemical characters of the two substances, the physiologist perceives well-marked points of difference between them. Fibrin has a constant tendency to coagulate spontaneously, while albumen, on the contrary, always remains in a state of solution; the two substances will ever be characterized by this essential property. As to the blood-globules, all those who have paid much attention to the subject, acknowledge they are totally independent of the two primary principles of blood just mentioned; but much has been said about their texture and minute composition. Some describe them as being composed of a nucleus of solid albumen and fibrin, enclosed in an envelope; while others describe them as formed by an envelope of fibrin enclosing albumen and hæmatosine. While the state of the science is so uncertain, the medical practitioner, who seeks what is really useful in the analysis of the blood, must not be led away by any hypotheses about the nature of fibrin, &c.; he should rather endeavour to ascertain what modifications they may undergo during disease."

The following is the quantitive analysis of blood as given by M. Andral.

	Drachms. French Measure.		Parts.
Fibrin,	0.54	or	3
Blood-globules,	22.86	or	127
Solid parts of serum,	14.40	or	80
Water,	142.20	or	790
	180 drachms, or 60 ozs.		1000 parts.

Pathological Conditions of the Blood.—The blood may undergo two different kinds of changes, first in quantity, and secondly in quality. With regard to the first we know little, for it has never yet been proved, for example, that the mass of blood is increased in plethora.

M. Andral commences this portion of his subject with alterations in the composition of the blood; of these there are two classes: 1st, the elementary components of the blood may be altered either in their nature or relative proportions. 2d. The composition of the blood may be changed by the addition of certain substances extraneous to it, as pus, bile, urine, &c. The microscopic examination of the blood, as it reveals to us several facts of very great importance, should follow the study of quantitive alterations, after which we may pass to the consideration of the changes which take place in the physical qualities of the blood, and its modifications during disease.

"But before we commence the study of the blood in a diseased condition, we should notice the influence exercised by two circumstances which are usually in operation during a state of disease, viz. abstinence from food and venesection. Formerly it was said that they diminished the solid elements of the blood, and increased the proportion of water; but this is too vague to be of any use. M. Andral has found, on analysis, that the change consists in a diminution in the quantity of globules, and that little alteration takes place in the quantity of fibrin before a considerable lapse of time. In estimating the influence of loss of blood, we must remember—1. That it may occur in acute diseases, where a moderate quantity of blood has been abstracted, and the patient forbidden to take nourishment. Here the quantity of fibrin is not sensibly diminished; but the globules are less numerous; 2. The hæmorrhage may be very violent and long continued, or the patient die of inanition; here the quantity of fibrin and of all the elements of the blood is notably diminished, and the volume of water is constantly increased. In one case of severe uterine hæmorrhage, the globules had descended to 21, (the normal quantity is 127;) the fibrin to 1·8; the solid parts of the serum to 61; while the proportion of water was 915. In many cases, however, the changes of proportion may affect only one elementary principle of the blood, or two may be involved; it is very rare to find the whole of them changed at the same time. The following are the limits of variation for each; in 1000 parts of blood the fibrin has varied from 0·9 to 10; the globules, from 21 to 185; the solid parts of the serum, from 57 to 104; and the water from 725 to 915.

"*Quantitive alterations of the elements of the blood in inflammation; increase of fibrin.*—The quantity of fibrin may vary, in a healthy state of the blood, from 2½ to 3½; but in acute inflammatory affections it is invariably increased, and this change forms a most important feature in the history of these diseases. The circumstances necessary for the production of an increased quantity of fibrin, are the *acute* nature of the inflammation, and the presence of *fever*. It might, at first, appear that the increase of fibrin depended on the fever, because it is proportionate to the intensity of febrile action; but experience soon demonstrated that it was essentially connected with the inflammatory process, of which the fever was merely a sign. We therefore must have some acute local inflammation whenever the quantity of fibrin rises above 3; with the exception of the local inflammation in small-pox and typhoid fever.

"The augmentation of the quantity of fibrin, M. Andral asserts, is so certain a sign of inflammation, that if we find more than 5 parts of fibrin to 1000, in the course of any disease, we may positively affirm that some local inflammation exists. A patient was admitted into hospital with symptoms of congestion of the uterus; an increased quantity of fibrin was found in the blood drawn from a vein; the existence of inflammation was immediately announced, although, up to the period of death, its rational signs were extremely doubtful; on examining the body, an abscess was discovered between the uterus and rectum. In another case, equally doubtful, 7 parts of fibrin were found; the lungs were in a state of inflammation. A patient labouring under scarlatina was bled; 7½ parts of fibrin were found in the blood; this increase only exists in cases of inflammation; the patient died, and the necropsy disclosed the existence of acute nephritis. We might quote a great number of similar examples, which demonstrate in the most clear manner that the diagnosis of inflammation may be founded on the increased quantity of fibrin in the blood. The average augmentation of fibrin in inflammation may be estimated at 7; the minimum at 5; the maximum at 10½. In cases of pulmonary tubercle, the maximum quantity is 5; but even this is found only in the third stage of the disease, when it is complicated with pleurisy, inflammation of the pulmonary tissue, &c., so that the increase of fibrin may depend on the latter complications. It now remains for us to examine how far this change of the blood may be influenced by certain conditions.

"*Constitutional influences.*—For example, what influence does the constitution exercise? According to generally received notions, we might suppose that the constitution of a strong athletic man must tend to increase the quantity of fibrin, in case he were attacked by inflammation. Such is not the fact; we do not find more fibrin than in persons of feeble constitution; the latter are as much subject to inflammation; nay more: weak, debilitated persons are more apt to suffer from inflammation than the robust, because the blood globules are diminished, and the quantity of fibrin is relatively, though not absolutely, increased. Hence, feebleness, diminution of the globules, and the consequent proportional increase of fibrin, give a predisposition or tendency to inflammation. Besides, practitioners are well aware of this fact, for they daily see the worst and most persevering examples of inflammation in subjects who have been worn down by previous diseases.

"*Concomitant affections.*—Diseases which may arise at the same time as the inflammation, or co-exist with it, do not prevent the characteristic increase of fibrin; thus, in chlorotic females, it rises to six or seven under the influence of inflammation.

"*Seat of the inflammation.*—The fibrin is always increased, whatever be the seat of the inflammatory affection, but the latter seems to exercise a certain degree of influence; the greatest increase was found in pneumonia and rheumatism. In 40 patients affected with rheumatism, the following were the proportions:—In one patient, 10 parts of fibrin; in two, 9 f.; in four, 8 f.; in eight, 7 f.; in nineteen, 6 f.; in five, 5 f.; in two, 4 f.

"*Pneumonia.*—The *maxima* and *minima* were nearly the same as in rheumatism. Fifty-two patients were examined. In two, the quantity was 10 f.; in nine, 9 f.; in thirteen, 8 f.; in eleven, 7 f.; in seven, 6 f.; in seven, 5 f.; in three, 4 f.

"*Pleurisy.*—Here we must distinguish several cases. 1. The inflammation may be quite recent. 2. Recent, but with effusion. 3. Chronic. In the first two cases the quantity of fibrin is increased, but it is much less than in pneumonia, and does not exceed 6. In the third case it varies between 4 and 5, or may descend even to 3½. Peritonitis gives exactly the same results: in acute peritonitis the fibrin oscillates between 5 and 7; in chronic cases, with effusion, it comes down from 5 to below 4; hence, in inflammations of the serous membranes, we must distinguish those cases in which the disease is active, and those in which the inflammatory process seems to have passed away, leaving behind it nothing but its products. In acute amygdalitis and in erysipelas, the quantities are from 5 to 7; in slight cases, from 3½ to 5; in one case of phlegmonous erysipelas of the leg, the quantity of fibrin amounted to 7.

"*Nature of the disease.*—This only influences the elevation of the number, representing the quantity of fibrin.

"*Duration.*—The augmentation of fibrin is observed at the very outset of the disease. M. Andral noted 17 cases of pneumonia; two were at the second day, (fibrin 4 and 6): two at the third day, (f. 5 and 7); nine at the fourth day, (f. 5½, 6, 7, 8); one case at the 5th day, (f. 7); one at the 8th, (f. 9); the same is observed in all other inflammatory diseases. But it may be asked, does the quantity of fibrin increase during the premonitory symptoms, before the actual development of inflammation? Does the latter arise *after* the blood has become overcharged with fibrin? It is impossible to answer these questions in the present state of our knowledge. In two cases blood was drawn from the arm, before the manifest existence of disease, and the quantity of fibrin was not found to be increased.

"*Progress of the disease.*—As the disease progresses, the quantity of fibrin increases; when the inflammation begins to decline, it decreases; the correspondence is most remarkable. Thus in case of severe pneumonia we bleed, and find from 8 to 9 parts of fibrin in the blood; the disease becomes more severe; we bleed again and again, and find 10 parts of fibrin. The symptoms now decline, resolution has commenced, and at once the quantity falls to 5. Nay, what is still more striking, whenever the disease presents alternations of increase and decline, as it sometimes does, these alternations are marked by corresponding changes in the quantity of fibrin. An example of this was seen in a case of acute articular rheumatism; a first bleeding gave 6·2 of fibrin; the febrile symptoms now abated; the pain diminished, and the fibrin fell to 3·7; a relapse took place, and the fibrin rose, at once, to 6; when the rheumatism became quite chronic, the quantity of fibrin did not exceed the normal figure.

"*Convalescence.*—During the convalescent stage, the quantity of fibrin sometimes remains a little high; but usually it returns to the healthy standard. It might be supposed that the increased quantity of food given during convalescence is the cause of the high figure; but this is not the case, because it occurs even when the patient is kept on very low diet, and the quantity often falls, although the diet has been much improved.

"*Bleeding.*—The general rule is, that the quantity of fibrin will rise above the normal standard, in spite of venesection, and that during a certain time; this does not prove that bleeding is useless, but simply that it cannot prevent, *instanter*, the tendency to the production of an increased quantity of fibrin.

"*Fibrin in Phthisis.*—The quantity is increased in the last stage only of pulmonary consumption, but the increase is never considerable; still the fact is a remarkable one, when we consider the deterioration which the blood must have undergone; it probably depends on the development of local inflammation around the tubercles.

"*Cancer.*—In one case of cancer of the uterus, the fibrin amounted to 5; and it reached the same figure in a case of cancer of the stomach; in one of cancer of the ovary it amounted to 6; but more cases are required to settle this point, because it is well known that diseases of this kind are frequently accompanied with local inflammation.

"*Pregnancy.*—One of the most remarkable facts pointed out by all practical physicians, is the tendency of puerperal females to be attacked by inflammation ending in suppuration. M. Andral has commenced a series of experiments on this interesting subject, of which the following are the first results. Twenty-eight women, all in good health, were bled at different periods of pregnancy. If we divide the whole period into two portions, one including the first six months, the other the last three, we find that the average quantity of fibrin during the first was 2·6; the maximum 2·7; the minimum 1·9; between the sixth and seventh months we have 4·2 of fibrin; from the seventh to the eighth, 3·1 of fibrin; after which it rises again to 4·2. Hence it would appear that during the first six months the quantity of fibrin is always below the normal standard: after this it is much increased, but from the seventh to the ninth month it varies. Hence, there is an augmentation of fibrin, particularly between the sixth and seventh month, and the eighth and ninth; and this may explain the frequency of, and disposition to, inflammation. These experiments, however, must be confirmed by more entensive investigations."

It has been thus clearly shown that the quantity of fibrin contained in the blood is constantly increasing during inflammation, but it may be asked, does this increase depend on the inflammation itself, or is it connected with the accompanying fever? M. Andral unhesitatingly answers, that it does not depend on the febrile movement. "We have, for example," he observes, "a large class of diseases, of which the principal feature is a fever just as intense, and often more protracted than pure inflammatory fever; now, in this class, we often find the fibrin either in normal quantity, or remarkably diminished. The class alluded to is the 'pyrexiæ,' and here the analysis of the blood points out a fundamental distinction between them and the class 'inflammations.' In addition to the pyrexiæ, M. Andral has found the quantity of fibrin diminished in cerebral congestion and hemorrhage.

"*Condition of the blood in the premonitory stage of continued fever.*—The blood was examined in eight patients, who were bled nine times. In no case was the quantity of fibrin increased; in three cases it was somewhat diminished, though still above 2; in two other cases the quantity of fibrin had fallen to 1·8 and 1.6; on the other hand, the proportion of globules was generally augmented, giving 136·4, 137·9, 142·7, 143·5, and even 157·7; in this latter case the fibrin amounted only to 1·6. When received into the hospital, the patient presented a very remarkable degree of muscular prostration; after some time he recovered his strength a little, and was then bled again; the fibrin had now increased to 2·1, but the globules had fallen from 157·7 to 129·3; and the solid constituents of the serum from 96·6 to 88·9. In all the cases the solid parts of the serum were abundant, while the watery part, on the contrary, never exceeded the average quantity, and in one case fell to 744·2.

"*Simple continued fever.*—The blood was examined in eleven patients, who were bled twenty-one times. In six cases the disease terminated favourably without any complication; in six others, it was complicated after a certain lapse of time with some inflammatory disease, such as erysipelas, angina, bronchitis, &c. Hence, these two series should be distinguished from each other, for obvious reasons.

"In the first series ten experiments were made; once the fibrin amounted to 5·6, that is to say, to the minimum figure of inflammation. The patient was a young girl, 18 years of age; when bled previously, the amount of fibrin was ascertained to be 4·6; no particular symptom was present to explain this augmentation of the fibrin, which was found on the seventh and ninth days; but since the same quantity was never found in any other case of simple fever, M. Andral thinks that it must have been connected with some inflammatory complication which escaped detection. In the other cases the fibrin varied from 4·2 to 2·2.

"The globules presented very remarkable differences; in one of the five cases, they amounted to the enormous sum of 185·1; the patient was 58 years of age, and affected with what Pinel calls inflammatory fever; the disease continued for eight days, and then terminated in recovery, without any dangerous symptom. In three other cases the globules amounted to 120·7, 117·4, 103·6; in the latter the fibrin marked 4·6. Finally, in the fifth case, the globules amounted to 82·5 only; but this was explained by the circumstance of the attack occurring in a chlorotic female. The solid parts of the serum varied from 98·7 to 90·9; the water from 725·6 to 851·9.

"We have now to consider those cases in which the simple fever became complicated by some local inflammation. Out of six cases there were three, (two of amygdalitis, one of erysipelas,) in which the inflammation produced no effect on the blood; but in three other cases, the fibrin was augmented to 4·5, and 5·4, while the globules diminished to 118·6, 114·7, and 94·1; these examples show how the blood is modified by the occurrence of local inflammation during the course of continued fever; when the inflammatory affection is slight, it produces little or no effect; but if severe, the quantity of fibrin is at once increased.

"*Typhoid fever.*—The blood was examined in twenty cases of this disease; fifty experiments were performed. M. Andral confines the term typhoid fever to that species characterised by ulceration of the mucous follicles of the intestinal canal; now, although the lesions which exist in typhoid fever are manifestly the result of inflammation, the blood is far from presenting the characteristic signs of an inflammatory affection; we find no augmentation of the quantity of fibrin in cases of typhoid fever, but, on the contrary, a diminution in many cases; as the fever becomes more severe, the fibrin diminishes until it reaches the minimum quantity. The remarkable decrease in the quantity of fibrin does not depend on blood-letting or an abstinence from food; while, on the other hand, the relative proportion of the fibrin increases as soon as the disease assumes a favourable change, long before the effects of food could be experienced. It has already been shown that in inflammatory diseases the blood globules are considerably diminished in quantity; in typhoid fever we find an opposite tendency; when we examine the blood at an early stage of the disease, we discover an evident augmentation of the globules, and this increase is proportionate to the period or stage of the fever; it is not, however, constant, like the increase of fibrin in inflammation, and is not, therefore, an essential element. Diminution of fibrin, then, with excess of blood globules, is the characteristic condition of the blood in typhoid fever; at an early stage of the disease the globules alone undergo an alteration, for the deficit of fibrin is merely relative, but as the disease advances, and the symptoms become severe, the fibrin diminishes actually as well as relatively. In one remarkable case, the fibrin fell as low as 0·9; the patient was in a state of extreme prostration at the time he was bled: there was delirium with considerable stupor; the tongue and teeth were covered with black crusts; the mucous membranes of the mouth and nose were the seat of passive hemorrhage; yet this patient recovered. In the various cases of typhoid fever examined by M. Andral, the blood furnished a maximum of 3·7 of fibrin, and a minimum of 0·9; the globules (examined in blood drawn at the first bleedings) were frequently above 130, and generally varied from 130 to 100; even when the patient was bled two or three times during the course of the disease, the figure representing the quantity of globules was a high one. In one case of typhoid fever, when three bleedings had been performed successively, the fibrin marked 5, 5·4, and 5; and it required a fourth bleeding to bring it down to 4. The reason of this apparent anomaly was manifest: the pulmonary congestion which so often accompanies typhoid fever had been replaced by acute bronchitis, and hence the increase of fibrin; the globules, however, were in great abundance, and the blood presented at one and the same time the characters of inflammation and of fever.

" *Eruptive fevers.*—The blood was examined in two cases of scarlatina, seven of measles, five of small-pox, and two of varioloid. In none of the sixteen cases was the quantity of fibrin augmented in any remarkable manner; once it rose to 4·4, but on the other hand it never descended so low as it does in typhoid fever; the minimum was 1·1, in all the other cases it varied between 3 and 2. The globules indicated an analogy to the pyrexiæ; they were augmented; but what is peculiarly interesting is, that this only occurred in scarlatina, and the majority of cases of measles, but never in small-pox or varioloid.

" *Intermittent fever.*—In this species of fever, where the intervals between each attack are marked by a return to apparent health, we might theoretically conclude that the blood does not undergo any important changes; experience proves this to be the case. In six cases of intermittent fever, the quantity of fibrin was always normal; the quantity of globules was, generally speaking, a little lower than it should be, but this may be accounted for by the condition of the patients on whom the experiments were made. The blood was drawn at every period of the fever, during the access; in the cold and sweating stages, and during the interval."

It will thus be perceived that the difference between the blood in the ordinary form of fevers and in inflammatory affections, is most marked. In fever the characteristic change seems to be a change of proportion between the fibrin and globules, the former being diminished. The experiments of M. Magendie on animals, have shown that one of the effects of this diminution of fibrin in proportion to the globules, is the production of hemorrhage or congestion, either in the parenchymatous tissue or surface of membranes. Now these two conditions frequently complicate febrile disorders, and hence the analysis of the blood corroborates the experiments of M. Magendie.

Cerebral congestion.—This term has been employed to designate a peculiar derangement of the brain, with the real nature of which we are little acquainted, but which in its early symptoms of headache, vertigo, and tendency to epistaxis, bears some analogy to the premonitory symptoms of typhoid fever. It is curious, M. A. observes, that the same analogy holds good with respect to the blood.

"In fifteen cases of cerebral congestion, the quantity of fibrin was frequently unchanged; but in several others it was considerably diminished; the maximum was 3·7; the minimum, 1·6. The latter case occurred in the person of an athletic porter, who was much addicted to spirituous drinks. On the other hand, the fibrin amounted to 3·5 in a female of excessively weak and delicate constitution. As to any relation between the degree of the congestion and the amount of fibrin, it is worthy of remark, that the minimum of fibrin was found in the case where the symptoms of congestion were the most intense.

"In six cases the globules did not undergo any change: in six cases they were diminished; in six increased. The solid parts of the serum never descended below their normal quantity, the maximum being 104·8. The serum varied from 740·2 to 820·3. Some of the fifteen patients were bled a second and a third time, but the quantity of fibrin was not perceptibly altered, while the globules followed the usual law of decrement."

"*Apoplexy.*—Seven patients labouring under apoplexy, were submitted to observation; they were bled eight times. The results obtained in some of these cases," says M. Andral, "were quite unexpected, yet consistent with what had been observed in cerebral congestion. The commonest change in the blood was a diminution of the fibrin with an augmentation of the globules.

"The first patient examined, for the purpose of ascertaining the state of the blood, was a woman, 59 years of age, who had been seized with a very violent attack of apoplexy two days before. The quantity of fibrin had fallen to 1·9; but the globules had risen to 175·5; the solid parts of the serum were unchanged (80·3); the fluid was much diminished, being 724·3. We were a good deal surprised at so remarkable an increase of the globules. After the third day, the patient began to come a little to herself; she was now bled a second time, and a considerable change was discovered in the constituents of the blood. The fibrin had increased to 3·5; and the globules, though still in excess, (137·7, had diminished. In this case the very great difference of proportion between the fibrin and globules, could not have been produced by the mere fact of some blood having been *lost* in the brain; for the loss of blood could not be abundant enough to cause so great a change, and the facts already cited show that hemorrhage always causes a diminished quantity of globules, but does not act with the same certainty in diminishing the fibrin. Hence we are forced to ask, whether the want of due proportion between the fibrin and globules, instead of being an effect of the apoplectic attack, may not have given rise to it, the more especially as we know that the blood has a great tendency to escape from its vessels, when deprived of its normal quantity of fibrin."

The results in five other cases are given, all which tend to show that the chief characteristic of apoplexy is a tendency to increase of globules, with a diminution of fibrin.

In the seventh case, however, the composition of the blood underwent little or no change; fibrin, instead of being diminished, was slightly augmented, 3·9; the globules marked 126·5; yet this was a very severe case, and the patient was bled on the second day. M. A. regards this as an exceptional, or rather negative case, and suggests that the slight augmentation of fibrin may have coincided with a commencement of inflammatory action round the affected clot.

Having thus examined the alterations in the *proportions* of the component parts of the blood, M. Andral next proceeds to consider the changes of *quality* which these elements undergo. The blood becomes altered, not only when the quantity and quality of its constituent parts are altered, but also when there is superadded to it some foreign ingredient. These foreign ingredients may be arranged into two classes: 1*st*, Those analogous to certain healthy products of the body, as bile, urine, milk, &c.; and, 2*d*, Those which bear no such analogy, as pus, cancerous matter, &c.

1*st*. *Alteration of the blood by the secretions.*—These alterations have been commonly supposed to be very common, whilst in reality they are very rare. Bile, urine, and milk, are the secretions, the presence of which in the blood is commonly admitted, and to which has been attributed various disorders.

Bile.—Recent experiments have shown that this fluid never exists in the blood, and that what was mistaken for it was one of its constituent elements, the green colouring matter. M. A. has examined the blood in a great many diseases where the presence of bile is supposed to exert some influence, but never found even any of the colouring matter, except in jaundice.

Urine.—This is never found in the blood, though one of its elements, urea, sometimes is. "MM. Prevost and Dumas extirpated the kidneys of animals, and afterwards discovered large quantities of urea in the blood, hence we might *à priori* conclude that certain diseases which disturb the functions of the kidneys, i. e. prevent them from eliminating urea from the blood, give rise to an increased quantity of that substance in the vital fluid. This occurs in Bright's disease, in which Dr. Christison and others have found more or less urea in the blood. Ancient writers used to talk of urinary fevers, or, in other words, of fever excited by the presence of urine in the blood; but this idea arose from the superficial observation of certain febrile disorders, during which the perspiration gave out an urinous odour." These observations M. Andral justly considers as wholly unworthy of credit.

Milk.—During the early part of the present century much was written about milk fever, and many admit its existence even at the present day; but chemical analysis overturns these theories at once; milk is never found in the blood; one of its essential principles, caseum, it is said, has been discovered in the blood, but M. A. does not admit the fact. Three centuries ago some cases were published of milky blood found in persons of either sex. M. Andral has examined most of these cases with great care and attention; not one occurred in a lying-in woman. Schenkius mentions a woman, not pregnant, whose blood appeared to be milky; Tulpius mentions a similar case, and several others are recorded in modern works. The serum is the part of the blood which presents the milky appearance that has deceived so many; it has been analysed by Trail, Caventou, and Christison, but they were unable to discover any of the constituent principles of milk. The white appearance depends on the presence of a fatty matter suspended in the serum, and forming with it a kind of emulsion; such is the opinion of Dr. Christison. M. Caventou attributes it to the presence of albumen, which has undergone some peculiar change.

The presence of these foreign principles in the blood may depend on the circumstance of the secretory organs not having eliminated them from the blood; this again, may arise, 1st, from disease of the secreting organ; 2d, from disease of the excretory canal; 3d, from some disordered nervous influence, such as occurs in essential jaundice. But the principle may have been separated from the blood and again introduced, or it may accumulate in consequence of not being duly eliminated.

2d. *Alterations of the blood by the presence of morbid products.*—These products may be formed—1st, in the blood; 2d, produced by the coats of the vessels, as pus in phlebitis; 3d, be introduced by absorption.

Pus.—This has been found in the blood under the following circumstances: "1st, In inflammation of the lining membrane of the heart or blood-vessels; 2d, in inflammation of the other organs; 3d, in cases of abscess, the pus being absorbed; 4th, in the middle of clots formed during life. The pus is found in various conditions; it may be mixed, more or less intimately, with the blood, changing its colour; sometimes it is deposited in isolated drops through the mass of blood. M. Piorry has found white granules, which he considers collections of pus, on the crust of the blood, in patients labouring under pneumonia. Finally, the pus may be collected in some quantity in the clots of the heart. When purulent matter has been thus mixed up with the blood, the latter becomes a poison; it loses its natural consistency, and is soft and friable.

"*Encephaloid matter.*—The veins of patients who die of cancerous affections sometimes contain masses of a reddish gray colour, which bears the closest resemblance to encephaloid matter, and it has been asserted that the blood itself has undergone the cancerous degeneration. Is any portion of the vital fluid transformed into cancerous matter, or is the latter merely absorbed? The records of medical science do not contain a single case in which encephaloid matter has been found in the veins, without the presence of cancer in some other part of the body; and the veins which contain the matter are, commonly, those in the vicinity of the part originally affected, or arise immediately from them. In cancer of the liver, we find the cava affected; in cancer of the kidney, the renal vein; in cancerous diseases of the pelvis, the iliacs and inferior cava; but it should be observed, that the cases of cancerous degeneration of the blood are much rarer than we might be led to suppose from the examples mentioned by authors, for various alterations of the blood have been frequently mistaken for absorption of cancerous matter."

We very rarely find in the blood any living? animals. M. Della Chiaja, an Italian physician, discovered an entozoon, which he has named *polystoma sanguinis.*

"*Virus.*—In certain cases the properties of the blood are altered by the introduction of some deleterious principle, such as gases, poisons, &c.; animal virus, as that of glanders, malignant pustule, &c., may likewise infect the blood. When animals are overworked, their blood becomes altered, and if injected into the veins of other animals, it occasions the most dangerous disorders."

The crust or buffy coat.—This is composed of fibrine, which retains a certain quantity of globules and serum, it varies in thickness, consistence and transparency, and may be perfect or imperfect; the former being opaque and of a yellowish white colour, the latter greenish and a mere rudiment. M. A. has sought for the existence of the crust in 1800 cases. The following are his most important results:

"In 12 cases of *acute amygdalitis* a perfect crust was found 9 times; 1 imperfect. *Bronchitis*, 123 bleedings; 35 perfect crust, 25 imperfect, 65 absent. The cases in which a perfect crust existed, were acute bronchitis with fever; the others, bronchitis without fever. *Colica pictonum*, 10 bleedings; 3 perfect crust, 7 absent. *Chlorosis*, 11 bleedings; 7 perfect crust, like that of rheumatism, 1 imperfect, 3 absent. From this we conclude, that the crust exists under very different circumstances, and that we must take into account not only the causes which favour or prevent its formation, but also the different elements of the diseases in which it may exist. *Asiatic cholera*, 6 bleedings, no crust. *Cerebral congestion*, 103 cases; 77 absent, 14 perfect, 12 rudimentary. *Pulmonary emphysema*, 36 cases; 26 absent, 10 pefect. *Pleuritic effusion*, 27 bleedings; 7 perfect, 9 imperfect, 11 absent. *Ague*, 32 cases; 27 absent, 5 present. *Typhoid fever*, 187 cases; 147 no trace of crust, 30 imperfect, 10 perfect: but in these the fever was complicated with some internal inflammation; hence we may affirm that the crust never exists in simple typhoid fever, and that its presence indicates some complication. *Apoplexy*, 22 cases; 2 perfect, 20 absent. *Encysted dropsy of ovary*, 4 cases; 3 absent, 1 present; in the latter the walls of the cyst were inflamed. *Hypertrophy of heart*, 72 cases; absent 61, present 11: to explain the latter, we should remember that many cases of hypertrophy are complicated with inflammation. *Bright's disease*, 6 cases; never any crust: this, in addition to other reasons, tends to prove that the disease is not inflammatory. *Acute pleurisy*, 60 cases; 50 perfect crust. *Pneumonia*, 230 cases; 215 perfect, 15 imperfect. *Acute articular rheumatism*, 134 cases; 125 perfect, 5 imperfect, 4 absent; in one of the latter cases, the patient was bled when nearly well. *Chronic rheumatism*, 50 cases; 11 present, 39 absent. *Measles*, 11 cases; no crust. *Scarlatina*, 9 cases; no crust, except in one case, complicated with acute nephritis. *Small-pox*, 18 cases; 2 perfect, 16 absent. *Pulmonary tubercles*, 203 cases; 140 perfect, 50 absent, 13 imperfect."

M. Andral next considers the phenomena observed during the formation of the buffy coat, and then the conditions necessary for its formation; these last he divides into essential and accessary. "The essential condition," he observes, "is an increase of fibrin, in proportion to the globules, and not a simple increase of the fibrin. When the blood contains an excessive quantity of fibrin, it coagulates slowly; thus the blood of a patient labouring under rheumatism coagulates more slowly than that of one affected with typhoid fever. On what does this slowness depend? M. Denis thinks that the buffy coat forms slowly, in proportion as the blood contains little of its salts and more soda. M. Andral seems inclined to think that the fibrin which coagulates more slowly is newly-formed fibrin.

"The increased proportion of fibrin to globules may occur in two ways: 1st, The globules remain unchanged, but the fibrin mounts from three to ten, and the buffy coat, under these circumstances, is invariably formed in proportion to the predominance of fibrin. Such takes place in inflammations, where the quantity of fibrin is increased, both absolutely and relatively. 2d, There may be a relative increase of fibrin, by diminution of the globules, the fibrin remaining unaltered; here, also, the crust forms as perfectly as during inflammation; the edges are turned up, and the cupped appearance is most evident; we have an example of this in cases of severe chlorosis; a beautiful specimen of the buffy coat was seen in the blood of a young girl, in whom the globules marked 28, instead of the normal number 127. The exposition of these facts is of the utmost importance, and is calculated to terminate various discussions amongst medical men, who were surprised to meet the buffy coat in cases of chlorosis, a disease commonly regarded as the opposite of inflammation.

"Unless the composition of the blood be altered in the manner just pointed out, the buffy coat of the blood is never formed, even under the influence of circumstances which have hitherto been supposed to produce it, when acting alone. These may *favour* the formation of the crust, but cannot produce it.

"The accessory conditions now alluded to, are—

"*a. Flowing of the blood.*—When the blood flows slowly, the crust is not easily formed, and *vice versâ.* The slow discharge of the blood gives time for one portion to coagulate before another; the last drawn blood only furnishes the fibrin at the upper part of the vessel, and hence the buff must be imperfect.

"*b. Opening in the vein.*—This must be large, and the blood must flow freely, otherwise the crust will not form; the reasons are the same as in the former case. However, we have a good buff with a small stream, if the blood flow rapidly.

"*c. Agitation.*—The abstracted blood must remain at rest, in order that the two layers already spoken of may be able to form rapidly, one over the other; the first is rich in fibrin, the second in globules, and if the vessel be shaken before the fibrin is completely coagulated, the globules get mixed with it, and the crust which afterwards forms is imperfect and soft. This is more particularly the case when the blood is agitated immediately after it has been drawn from the vein.

"*d. Elevation of the jet.*—It has been said that the buffy coat will not form when the blood falls from a considerable height; this may depend on the separation of the parts of the blood taking place before it reaches the vessel.

"*e. Form of vessel.*—In a deep narrow vessel the crust forms readily; in a wide one it is thin and apparently insignificant; but the appearance is deceptive; the crust is the same in both cases, gaining in extent of surface what it has lost in depth.

"*f.* The *materials* of which the *vessel* is composed exercise no influence whatever.

"*g. Temperature.*—Heat impedes the formation of the buffy coat, according to some authors. M. Andral has never seen any difference in the thickness of the crust during winter and summer. However, we can conceive that cold may impede the formation of the buffy coat, by causing the blood to coagulate rapidly; if the vessel be surrounded with ice, or strongly heated, the buffy coat will not form."

Much importance has been attached to the buffy coat as characteristic of inflammation; in this respect M. Andral regards it as valueless.

"*Serum.*—The quantity of serum which surrounds the clot often represents correctly the actual quantity in the blood, especially when the clot is small and dense; but a large clot retains a considerable quantity of serum. The *colour* of the serum may be greenish, yellow, reddish, or of a milky tint; these differences depend on the presence of some globules mixed up with it. The saffron yellow colour often depends on the presence of the colouring matter of the bile. The white serum bears some resemblance to skimmed milk, and by some writers this appearance is thought to depend on the presence of milk in the blood. It is produced, however, by an increased quantity of fatty matter in the blood.

"The density of the serum in different diseases is little known; M. Rayer has bestowed some attention on this point, and obtained several interesting results. In Bright's disease, the density of the serum is lessened, from the elimination of albumen: the loss of globules will also diminish the density of the serum; in acute inflammation the same effect is produced by the diminution of globules; and in scleroma, M. Chevreuil has observed that the serum which separates from the clot, presents a very remarkable gelatinous appearance."

M. Andral next briefly alludes to colour of the blood on being drawn, its odour, taste, temperature, electricity, and consistence. He does not believe in the existence of white blood, spoken of by authors. The blood may be paler than normal, as in anemia, and in persons of nervous temperament; and also of a higher colour when the proportion of globules is great. Venous blood may also assume an arterial tint, but under what influences this arises is not settled. It has been said that certain diseases, and particularly those depending upon miasma, have the effect of giving the blood a dark tinge; but M. Andral thinks that we must receive these assertions with considerable reserve, because they seem to be founded on prevailing theories respecting the action of miasma.

M. Bellinghieri made some experiments on the *electric* conditions of the blood, from which he draws the following conclusions:—1. The quantity of electricity manifested by the blood is diminished during acute inflammation, and falls in proportion to the intensity of the inflammation. 2. In chronic asthenic diseases, the quantity of electricity is increased, but when general reaction sets in, it falls. 3. Blood which furnishes a buffy coat contains more electric power than other blood, and when we find an increased quantity in the blood, we may be certain that it will not coagulate; the more fibrin it contains, the less electrical power does it manifest.

"The degree of *consistency of the blood* which is contained in its vessels, corresponds with that which exists when it has been abstracted from them; if fluid, and of little consistence when drawn from a vein, we may conclude that it possesses the same properties while circulating: when the consistence of the blood is slight, it has a great tendency to escape from its vessels. Blood which contains a considerable proportion of fibrin, has quite an opposite tendency; in a word, the consistence corresponds exactly with the quantity of fibrin. In the earlier schools of medicine a good deal was said about thick and thin blood. The doctrines of Boerhaave's school reposed entirely on the greater or less consistence of the blood, that is, on a fact, the existence of which was by no means demonstrated. M. Magendie has endeavoured to show that several disorders depend on a viscid state of the blood; he mixed with the blood some gum and starch, and found that when thus altered it became arrested in the lungs; pulmonary congestion was the consequence, and the animals died in a state of asphyxia. When very finely powdered charcoal was mixed with the blood, it merely occasioned some difficulty of breathing which soon passed off: M. Andral concludes from these experiments, that if the blood be rendered too thick, certain disorders are excited which depend on obstructed capillary circulation."

M. Andral asserts that it is impossible to demonstrate that the blood ever becomes thicker in certain diseases, though he admits that we may suspect such to be the case. For ourselves, we do not know how it can be doubted that such a condition exists in epidemic cholera. M. Andral does not believe, however, that the retarded circulation in that disease depends upon that condition, since we do not find, he says, the pulmonary congestion which always occurred in M. Magendie's experiments.

"Much stress was laid in former times upon the spontaneous coagulation of the blood in its vessels. Stahl relates the case of an epileptic female, whom a surgeon endeavoured to bleed, but was unable to obtain a drop of blood; he divided the vein at another place, and extracted a long coagulum, which filled up the vessel. M. Andral observed an exactly similar case at La Charité, about two years ago; the patient died, and, on examining the body, several other clots were found in different parts of the vascular system. It has also been said that an acid has been developed in the blood, but this has never been proved; perhaps, in some cases of poisoning with sulphuric acid, a certain quantity of the latter may be absorbed, and give rise to the coagulation of the blood. M. Bouchardat has observed a case of this kind: a man swallowed some sulphuric acid; one of his lower extremities became very cold, and, on examining the body after death, the whole of the femoral artery was found filled with a clot; the author likewise assures us that he discovered sulphuric acid in the blood."

Coagula of blood in the heart, termed polypi, are frequently mentioned by ancient writers, and various symptoms and affections were ascribed to them, which a more intimate knowledge of morbid anatomy enables us to explain. "The most obscure point connected with the history of these clots is the period of their formation. The clot may be composed entirely of fibrin; it is then colourless, or of a whitish yellow tint; if the clot contain any globules, it is more or less red; sometimes the globules are disseminated through the clot, and give it a striated appearance, which bears some resemblance to vascularity. The white clots are the firmest; the red ones are soft; the manner in which they adhere to the heart varies considerably; sometimes they are interlaced with the valves; sometimes adherent to the lining membrane by means of a false membrane which envelopes them, but this adherence does not prove that the clots were formed before death; they are analogous to those which unite the blood to the sides of the vessel into which it has been received.

"The diseases in which we find clots most frequently are diseases of the heart; 1st, because the contractions of the heart are irregular and frequent; 2d, because the openings are contracted and misshapen, or altered in a manner which favours the coagulation of the blood; 3d, because the lining membrane of the heart is often rough and irregular."

M. Andral has never observed vessels in these polypi, and does not believe in the assertion, that they have been injected through the coronary arteries. The presence of pus in these coagula, are also unsatisfactory proof of their being formed during life, for the pus being mixed with the blood, we can readily understand how the coagulation of the latter, after death, may cause the former to be enclosed in the clot. The formation of these polypi in the heart, M. A. thinks rare.

"The blood may coagulate in the vessels of the lower extremities; this depends on inflammation and ossification of the arteries; sometimes, however, we can discover no change in the blood-vessels; the limb gets gradually cold; the pain is so severe that opium is unable to calm it, and the extremity becomes gangrenous. Coagulation of the blood in the veins depends on phlebitis, or compression on the vessel; according to M. Andral, these are never sufficient to produce gangrene. When the veins are filled with clots during life, we feel hard, knotty cords under the finger, and this symptom alone will furnish a diagnosis."

As certain forms of disease consist merely in excess of temperament, M. A. conceives it proper next to examine the condition of the blood in various temperaments, and his observations on this point are of great practical value.

Sanguineous Temperament, Plethora.—There is no other difference than one of degree, M. A. considers, "between the sanguineous temperament and plethora, whether natural or morbid. Considerable influence has been attributed to the blood in the production of temperaments; people are said to be sanguineous under the supposed idea of an excess of blood; the influence of other fluids is expressed by the terms bilious and lymphatic. The sanguineous temperament is a condition of the system which, when much increased, constitutes plethora; people of this temperament are usually very strong, and all their functions are extremely active; it has been affirmed that they have a greater quantity of blood, and that the latter is more rich than the blood of other persons; as proof of this, the existence of a large clot with tendency to buff, has been cited, as indicating an increased quantity of fibrin. But, in the first place, we cannot affirm that sanguineous persons have more blood than others, since the normal quantity of that fluid in the human body is unknown. From the observations of M. Andral, however, it would appear that the solid elements of the blood are increased while the serum is diminished. In the second place, we cannot rely on a simple inspection of the clot; we must determine if it be the fibrin which is increased, or the other elements of the blood; it is generally thought that it is the fibrin, but this idea is far from being correct. Neither the fibrin nor the albumen are increased in the sanguineous temperament, but the globules, which may augment from 127 to 140; beyond this latter we have a state of disease.

"If the blood be examined before coagulation, it presents a deep-red colour, depending on the increased quantity of globules; the clot is large for the same reason, and because a good deal of serum is retained by the globules; but the firmness of the clot is not augmented, as people generally believe. One of the chief characteristics of plethoric blood is, that it never presents a perfect buffy coat; a circumstance explained by the small quantity of fibrin compared to the globules.

"The signs of the plethoric habit are normal or morbid. All the functions are remarkably active; life is, as it were, in excess, from the excess of blood globules; the digestive process goes on rapidly; the respiratory apparatus is developed, and the capillaries always injected: hence the bright colour of the cheeks, lips, skin, &c. The heat of the body is high; cutaneous transpiration and the secretion of urine active; the urine is deeply coloured, and charged with salts. The passions are strong and easily roused, but though the brain be very active, the sensibility is not great, as in persons of nervous temperament; nervous symptoms do not belong to the sanguineous temperament: it appears that while the blood globules increase, the sensibility diminishes, a circumstance exactly the reverse of what takes place in chlorotic patients, whose sensibility is extremely acute, hence we may conclude, that an augmentation of the quantity of the globules produces an unusual activity of all the functions, save those of the nervous system.

"The morbid signs or effects of plethora are of three kinds, viz. congestion, hemorrhage, and fever. We all know how readily congestion of the brain occurs in plethoric persons; hemorrhage, also, frequently takes place in the tissue of organs, or from the mucous membranes. The globules being increased in quantity, the normal proportion between them and the fibrin is changed, and the cohesion of the blood is lost. The acceleration of the pulse seems to depend entirely on increase of fibrin. Plethoric persons are not more disposed than others to inflammation, as has been generally supposed; indeed, they seem to be less disposed; but when inflammation does occur, it acts on a system in a state of superexcitement, depending on plethora.

"The advantages of venesection in plethoric persons are explained by the condition of their blood. The effect of blood-letting is to diminish the quantity of globules; hence it combats directly the essential element of plethora.

"*Lymphatic Temperament. Anæmia.*—Of anæmia, the general feature is a diminution of strength, and deterioration of several functions; when the lymphatic temperament is carried to an extreme, it leads to scrofula, and not to anæmia. Ancient writers employed the words "lymphatic temperament," to express a condition of the system in which colourless fluids, and particularly the serous part of the blood, predominated. After the discovery of lymphatic vessels, the term was used in another sense, and applied to predominance of lymph in the lymphatic system. In latter days we have returned to the old idea. M. Lecanu tells us, that the quantity of globules is diminished in lymphatic persons; M. Andral coincides with this opinion; the colouring matter of the blood is, also, in smaller quantity; hence the skin is pale, the iris light, the hair scanty; inflammation is slow and irregular in persons of lymphatic temperament. When in excess, this temperament leads to scrofula.

"There is another condition of the system compatible with health, which we may denominate the anæmic temperament; when carried to excess, this constitutes chlorosis or morbid anæmia. In the anæmic temperament, the fibrin is not diminished, nor does its quantity fall until the state of anæmia is carried to a great height, as in cases of hemorrhage, or considerable loss of blood; in spontaneous anæmia, the diminution of fibrin is not so considerable. The chief feature in anæmia is a diminution in the globules, but this varies much; sometimes it is slight, yet the symptoms are severe, or the reverse may occur. However, we may state it as a general rule, that the intensity of the anæmia is measured by the fall of the globules; it commences when the globules descend from 127 to 80, and is more evident as they fall to 60, 50, or 40: in some extreme cases they are as low as 27; the serum, in the mean time, augments.

"*Symptoms of the Anæmic Temperament.*—There is scarcely a function which is not more or less disturbed, the general sensibility, the intellectual faculties, motility, digestion, circulation. When the anæmia is slowly developed, the intelligence remains perfect, but when the loss of blood has been rapid and abundant, the faculties of the mind are deranged, and violent delirium ensues; the increase of serum and loss of globules change the properties of the blood which circulates through the brain. One would imagine that diminution of the globules should depress the functions of the nervous system, as it does other vital actions; but daily experience shows that the contrary occurs, that anæmic persons are extremely sensitive. The slightest noise disturbs the ear, and makes the patient tremble; the skin is acutely sensitive; the internal sensations are also exaggerated; the stomach is affected with severe pain, and the digestion impaired; various disorders of vision and hearing occur, with disturbance of the mind, pain in the head, hallucinations, &c. The motor power is likewise deranged; some individuals are affected with symptoms like those of chorea, and animals bled to death are violently convulsed.

"The digestive process is always disturbed; the appetite fails, or is replaced by a morbid taste for various substances; the vomiting which occurs depends on weakness, and hence tonics or nutritious substances are digested more readily than those of an opposite nature; beef soup will remain on the stomach, while chicken broth is rejected. The treatment of cases of this kind must consist in the administration of tonics. The respiration is frequently impeded, and the action of the heart more or less disturbed. Palpitation, the true cause of which is sometimes mistaken by medical men, depends on the impoverishment of the blood, and is proportionate to it; the frequency of the heart's pulsation is not increased until the affection has reached a certain degree of intensity, but when it is at its maximum, the pulse becomes slow, this latter state, however, is extremely rare. The parts rich in capillary vessels are pale, because the blood is surcharged with serum; but congestions are apt to occur at certain points, and produce circumscribed patches of injection, as in the conjunctivæ, for example; they seem to depend on want of sufficient energy in the nervous system, and may with justice be called passive.

"The ready manner in which they disappear under the use of tonics, proves that they depend on want of tone in the system. Hemorrhage very seldom occurs: on examining the heart we find various abnormal sounds which are analogous to those depending on obstruction of the orifices; these sounds are of two kinds, one intermittent, the other constant; the former always coincide with the systole of the heart. Here we may ask, do these morbid sounds always depend on the changes in the composition of the blood now pointed out? Certainly not; hence the following propositions merit attention.

"1st. When a patient has been bled several times, or suffered from frequent hemorrhage, the *bruit de souffle*, either permanent or intermittent, often occurs, but not constantly.

"2d. In spontaneous anæmia the same bruit exists.

"3d. Whenever the blood globules fall below 80, the *bruit de souffle* is constantly heard in the arteries, and sometimes in the heart.

"4th. The same often occurs with diminution of the globules between 80 and 100; or in rarer cases, between 100 and 125.

"5th. In some very rare cases the *bruit de souffle* exists when the globules are at 131 to 137; hence we must conclude that it is not exclusively connected with diminution of the globules.

"The above results were obtained from an analysis of 93 cases, in which the *bruit de souffle* existed in the heart or arteries. Amongst the 93 cases it was permanent in 56; and in the latter the globules were 28 times above 80; 13 between 80 and 100; 10 between 100 and 115; 5 between 115 and 125. It was intermittent in 3 cases, where the globules were below 80; in 13 between 80 and 100; in 8 between 100 and 115; in 5 between 115 and 125; in 3 between 125 and 137; and in 3 between 131 and 137. The intermittent souffle is less valuable as a symptom than the constant, the latter is more characteristic of diminution of the globules, and becomes intermittent as their proportion is increased.

"The *bruit de souffle* occurs in several other diseases, as well as in chlorosis. In one case of rheumatism, where the globules were at 97, the permanent bruit was heard; it was intermittent in another case, where they were at 99; from 81 to 97, it was sometimes permanent, sometimes intermittent. This bruit very rarely occurs in pneumonia, although the patient may have been frequently bled; a circumstance readily explained by the inflammatory nature of the disease; but it should be remarked, that the globules never fall as low in pneumonia as in rheumatism. From the above, it is evident that abstraction of blood is injurious in persons of anæmic temperament, unless there exist some disease which imperatively demands it; on the contrary, substantial diet augments the globules, and hence is beneficial; the same remark applies to the preparations of iron, which increase the proportion of globules, and not the fibrin.

"*Nervous Temperament.*—When the nervous system predominates, individuals are said to be of nervous temperament. In some persons of this constitution the blood is altered, in others not. Every physician knows that certain individuals can never bear bleeding well; the digestion suffers from it; palpitations occur, and other symptoms which indicate the evil influence of loss of blood. In persons of this description the globules are diminished, and if we diminish them still further by venesection, we give rise to various nervous disorders; abstinence from food, also, is not easily supported, especially when the stomach is diseased. How many gastric neuroses are produced and kept up by improper treatment and rigid abstinence! The secret of the miraculous cures effected by certain quacks, depends on their supporting the stomach by powerful tonics and substantial food."

M. Andral concludes his course with a very interesting investigation into the alterations of the blood in fever, inflammation, congestion and hemorrhage. His observations on these subjects are of the highest importance in a practical bearing, and we shall lay them in full before our readers in our next No. Our extracts have reached to such a length that we must break off for the present.

Art. XIII. *A Therapeutical Arrangement of the Materia Medica, or the Materia Medica arranged upon Physiological Principles, and in the order of the General Practical Value which Remedial Agents hold under their several denominations, and in conformity with the Physiological Doctrines set forth in the Medical and Physiological Commentaries.*—By Martyn Paine, M.D., A.M., author of the Commentaries, and of the Letters on the Cholera Asphyxia of New York, and Professor of the Institutes of Medicine and Materia Medica in the University of New York. New York: J. & H. Langley. 1842, 12mo. pp. 271.

Upon first taking up this book, we supposed from its appearance that it was a syllabus designed to facilitate the studies of the class attending the lectures of the author; we find, however, that other and higher purposes are aimed at, and which are distinctly set forth in the preface. They are the following:

1. To arrange the materia medica upon intelligible physiological and therapeutical principles.

2. To indicate the relative therapeutic value of the various articles under their different denominations, by arranging them in the order of their value.

3. To give to the students a comprehensive and ready view of the merits of the various articles composing the materia medica, and of their relations to each other physiologically considered.

4. To supply a convenient means of graduating the doses of medicines.

The principles in accordance with which the arrangement is made are fully set forth in the "Commentaries" of the writer; these must therefore be understood before there can be a full comprehension of the basis upon which his classification is founded. In the introductory remarks, there is set forth in the form of axioms, which have reference to the work mentioned, the author's physiological creed, the most striking peculiarity of which is, a rejection of all "humoral" explanation of the modus operandi of therapeutic agents, and an exclusive adoption of "solidism." The following quotation will give an idea of the manner in which this belief is propounded. "Remedial agents operate directly upon the vital properties of the parts to which they are applied, and through the medium of those parts upon remote organs, by the principle of sympathy. The partial absorption of certain remedies is only a contingent result, and has little or no agency in the physiological phenomena. Their reported absorption is greatly overrated, often only imaginary and sometimes misrepresented. Such as have no natural relation to the vital properties modify the natural condition of the absorbing vessels before they can enter the circulation." In remarking on such doctrine, we have no intention of entering upon any discussion, with respect to its tenability, or of bringing forward in detail the facts and arguments by which an opposite opinion may be sustained; we may state, however, that we are not a little surprised to find at the present date, so decided an advocate of an almost exploded system, which has always appeared to us extreme in its conclusions. It seems to us that the writer has not been felicitous in holding up balsam of copaiba, in illustration of his views, which, he informs us, "affects particularly the mucous tissue of the urethra; a phenomenon analogous to the irritation of the neck of the bladder by cantharides, and involving a beautiful illustration of remote sympathy."

For the classes, the orders, and the subdivisions of the orders in their consecutive position, we must refer to the book itself, attempting only to give an idea of the whole by the citation of a part; thus the first class is *Antiphlogistics*; of this the fourth order is *Alteratives;* the subdivisions, (A) General Antiphlogistic Alteratives, (B) Limited Antiphlogistic Alteratives. 1. Adapted to scrophulous inflammation. 2. Adapted to syphilitic and certain other chronic inflammations. 3. Adapted to syphilis complicated with scrophula. 4. Adapted to rheumatic inflammation. 5. Adapted to intermittent fever and intermittent inflammation. 6. Adapted to obstinate and chronic cutaneous diseases, illustrating farther the physiological effects of certain remedies.

In grouping the different substances under their respective denominations, in the order of their value, it seems to us that an arbitrary assumption must in a measure prevail, the task is involved in all the difficulties arising from the modifying circumstances of climate, disease, age, idiosyncrasy, &c. As a specimen of the manner in which this has been fulfilled by the author, let us take *Cathartics*, the second order of his first class, Antiphlogistics. He divides them into thirteen groups.—1. The mercurial cathartics. 2. Jalap, podophyllum, spurious jalap, wild potato. 3. Castor oil. 4. Aloes. 5. The saline cathartics. 6. Rhubarb, mountain rhubarb. 7. Senna, purging cassia, buck thorn. 8. Calcined magnesia, carbonate of magnesia. 9. Colocynth, scammony, gamboge, black hellebore, elaterium, white hellebore. 10. Croton oil, spurge oil. 11. Mild aperients, as extract of butternut, sulphate of potash, bitartrate of potash, sulphureous and saline waters, common salt, sulphur, manna, tamarind, dandelion, soap. 12. Thoroughwort, fever root, buck bean. 13. White bryony, variegated iris, tuberous iris, creeping hairy spurge, American poke-root, Indian hemp, cahinça root, purging-nuts, mezereon, hedge hyssup. How far success has been attained in this detail of the "relative therapeutic value of the various articles," we leave to be judged of by the individual experience of each particular reader.

In graduating the doses of the different medicines, in accordance with the different periods of life, the author has followed as nearly as it is possible, the excellent rule of Dr. Young, which has never been improved upon, and which he states in his chapter on general principles.

The mode of stating formulæ has nothing to recommend it in our estimation; each class, order, sub-order, and substance is expressed by a number, while the preparations under them are signified by letters; in order, therefore, to comprehend the formulæ which point out the proper modes of combining medicines, it becomes necessary either to retain in the mind the corresponding numbers of the substances to be combined and the letters answering to their preparations, or to refer backwards and forwards, through the pages of the book to ascertain their meaning. Thus under the head of aloes, we have the following:—℞. a. 1. order 4, A. 18, class 4, order 1, 13. 16. which is intended to set forth the following combination: ℞. aloes, calomel, ipecacuanha, Dover's powder, henbane. From this exemplification of the system, we think the objections stated are sufficiently obvious to prove at least its inconvenience, independently of other considerations which might be urged against it. In concluding our notice we must award the author the merit of industry, as it is apparent the arrangement of the contents of his production must have cost him no small amount of labour. For its defects he pleads the shortness of the time in which it was prepared, and as he was engaged in delivering a course of lectures during the same period, an arduous occupation, his apology may be fully admitted. J. C.

ART. XIV.—*Insanity and Insane Asylums.* By EDWARD JARVIS, M. D., Louisville, Ky. 1841, pp. 40.

THE observations under the above title were originally published in the Western Journal of Med. and Surgery, with the view of demonstrating the curability of insanity, and exciting, among the citizens of Kentucky, an increased interest in the Lunatic Asylum near Lexington, which was one of the very first in the Union established by state authority. After giving, somewhat in detail, a narrative of the abuses which formerly disgraced the practice of those to whom the care of the insane was entrusted, Dr. J. passes in review, and in striking contrast, the gratifying results of judicious treatment, as shown in the reports of several American institutions. Dr. Jarvis very justly remarks, that no reason exists why, during a series of years, the mortality at the Lexington Institution should be so disproportionately great, and the ratio of cures so very small, except from some radical defects, either in its structure, location, or organization. It is now well understood that insanity is, in its earliest stages, in a great proportion of cases, a curable disease. It is also equally well understood, that no asylum can be conducted in the best and most efficient manner, where buildings do not admit of a proper classification of patients, are not thoroughly warmed and ventilated, and if ample grounds for out-door labour and exercise are not attached to the institution; but more important than all these, if the general care of the patients, and the regulation of the moral, as well as the medical treatment, is not entrusted to competent physicians, willing to devote themselves to the subject.

The highest talent in the profession can do little towards curing insanity, by occasional visits to an institution, where they have no medical assistant qualified to carry out their directions.

Passing over what is due to suffering humanity, there is another consideration very justly insisted on by Dr. J. in urging the importance of giving promptly the best accommodations and the most judicious treatment to all the insane, viz. the *economy* of such a course. Had every populous state erected a Lunatic Asylum twenty years ago, and had they been placed under proper government, we hazard little in expressing our belief, that by this time the entire cost of their construction would have been saved to the community. The experience of other states, we have no doubt, would have been found equally conclusive on this point as that of the Massachusetts State Lunatic Asylum, where the entire cost of supporting twenty-five recent cases, from the time of their attack till their restoration, was only 56 dollars each, while that of supporting twenty-five of the old cases was 1903 dollars each.

The paper of Dr. J. is well calculated to effect the object for which it was written, and the facts it contains are valuable in connection with the statistics of insanity. The day, we trust, is not far distant, when public opinion will demand, from every state government, ample provision for the treatment of all recent cases of insanity, and for the comfort and safe keeping of all that are incurable. T. S. K.

ART. XV.—*Quarterly Summary of Transactions of the College of Physicians of Philadelphia*, November and December, 1841, and Jan. 1842, 8vo. pp. 22.

THE College of Physicians of Philadelphia is a very venerable institution, having been founded in 1786; and in its early days was an active one, and published one volume and a part of a second of Transactions. For nearly half a century, however, it has been in a very lethargic state, from which we are happy to find that it has at last awakened; for from its respectability and position, it might, by well directed efforts, exert a wholesome influence over the profession, and contribute largely to the advancement of our science.

The present publication contains a brief history of the college, a list of its officers since its foundation, and a summary of its proceedings during the months of November and December, 1841, and January, 1842.

The principal communications made to the college during that period, were the "Annual Report on Surgery," by Dr. Parrish; observations on a change of voice, following extirpation of the tonsils by the same; account of a case in which death resulted from an abscess behind the pharynx, by Dr. Morris; and a case of death from over distension of the bowels producing pressure upon the diaphragm, to such an extent as to prevent respiration, by Dr. Ashmead.

Dr. Parrish's report on the progress of surgery is an interesting one, but contains nothing with which our readers are not already acquainted.

The peculiar change of voice following extirpation of the tonsils, Dr. Parrish is, we believe, the first to point out. It consists in "a peculiar shrill, nasal twang in pronouncing certain words," rendering the voice very unpleasant. This change Dr. P. ascribes to adhesion of the edge of the anterior half arch to the remaining portion of the tonsil, the former being also dragged down as the latter diminishes in size; by which the space between the arches on the side of which it occurs is lessened, and the freedom of motion of the velum impaired. This condition Dr. P. has also observed in some cases before any operation. The subject is worthy of further investigation.

The case of death from abscess behind the pharynx, communicated by Dr. Morris, occurred in a lady 25 years of age, far advanced in pregnancy, (8½ months,) who was attacked, Thursday, May 7, with slight soreness of the right side of the neck, about half way between the angle of the jaw and the clavicle. When Dr. M. saw her, she had "some fever, which had been preceded by a slight chill. On Tuesday she had fatigued herself by an unusually long walk, and on Wednesday had ridden into the country, and spent a considerable time on the damp ground, walking and standing. There was no external swelling, nor was there any redness or other indication of inflammation of the tonsils or pharynx.

"A smart saline purgative subdued the fever, and relieved her so much, that on Saturday she was able to attend to her domestic duties, and spent the evening with much enjoyment in the family circle. A severe chill on Sunday morning ushered in a renewed attack. The fever was very high. There was a slight degree of swelling and redness of the soft palate and uvula, no external swelling, and no enlargement of the tonsils. Bleeding was proposed, but postponed in compliance with the prejudices of the patient. An active saline cathartic was administered, and a common gargle directed. On Monday morning I found she had passed a sleepless night, sitting in the lap of her husband, from her dread of strangulation should she lie down. There was a slight cough and much greater difficulty of swallowing than could be attributable to the apparent condition of the throat, which was examined with great care, the tongue being depressed, and the mouth well opened. The heat of the skin was very great, but without any redness, the circulation was rapid, and the countenance expressive of distress. Bleeding was now insisted on, and practised promptly and largely, without, however, affording any decided relief. Leeches were applied to the throat in the afternoon, and morphia administered at night, much of the restlessness of the preceding night, and of the dysphagia being ascribed to the excitable condition of the nervous system, owing to her approaching accouchement; respecting which she had much anxiety, excited by the death of an intimate friend in childbed a short time before.

"Tuesday morning found her with an increase of all the symptoms; she had passed a sleepless night; her pulse was very rapid, soft, and voluminous; the heat of the skin very great. She was unable to raise the natural tones of her voice; the uvula was slightly swollen, and there were some small deposites of lymph upon it. There was a little cough. I bled her again freely, but without any mitigation of her symptoms; she drank with tolerable ease, but was unable to swallow solids, or to lie down. There was no apparent increase of swelling, and nothing visible which could account for the great difficulty in swallowing. The tongue was clean and pallid. The common gargles were used freely, and promoted an abundant discharge of mucus from the fauces. She took during this day, Tuesday, freely of gruel and some ice cream. Morphia was again resorted to in the hope of procuring sleep at night; and, though the symptoms were of so anomalous a character, no apprehensions were excited of an unfavourable result. Wednesday morning found her with entire aphonia, slight cough, and utter inability to swallow; the fever was unabated; the bowels had been freely opened by cathartics given the previous day. Gargles were applied with a syringe, and always with some relief, and frequently she was able to swallow small portions immediately after their use. I examined the fauces and the neck at each visit, but without being able to ascertain any cause for the urgency of the symptoms; a blister was applied to the throat, and the gargles were employed as before; and, as there was no marked difficulty of breathing or other symptoms indicating urgent danger, an anodyne was given, and she was left for the night. About 11 o'clock, labour commenced, and Dr. Hodge was summoned to see her at my request. There appeared at this time an abatement of all the symptoms; she lay quietly on her left side, slept between the pains, which were regular and efficient, and spoke freely with her natural tone of voice. Dr. Hodge retired to rest, and I remained with her during the greater part of the night. Towards morning, there appeared to be a cessation of the expulsive effort, although the uterine contractions occurred at the usual intervals, and Dr. H. was called to see her. The heat of the skin was at this time so great, and the pulse so voluminous and rapid, that Dr. H. suggested the propriety of further blood-letting; it was not, however, put in practice; but, about 7 in the morning of Thursday, the head presenting naturally and at the lower strait, the pains being suspended, the forceps were applied, and she was promptly and safely delivered. The placenta was soon expelled, the uterus contracted firmly, and not more than ten or twelve ounces of blood were lost. The volume and force of the pulse at the wrist was instantly reduced, but its frequency remained undiminished. We remained with her some hours, endeavouring to procure the passage of some food into the stomach, but ineffectually. She could sit up, allowed a weak solution of sulphate of copper to be injected into her throat, which she threw again from her mouth, but could not swallow. Her voice was hoarse, but there was little cough and no difficulty of respiration.

I saw her again about 12 o'clock, without finding any change in the case. About two, I was summoned to her, and, fearing hemorrhage, or some urgent symptom, despatched the messenger who had come for me to call Drs. Hodge and Meigs. We all reached her chamber at nearly the same time, and found her unable to lie down or to swallow, with a very rapid pulse, a warm, moist skin, and perfect mental composure. Various efforts were made to ascertain the seat of her difficulty. There was no swelling to account for it, no appearance of disease about the throat internally, nor any cerebral symptoms, and yet our patient was evidently in a condition of great danger; the respiration was unobstructed, though the voice had again sunk to a nearly inarticulate whisper. There was no sound like that of croup in respiration, and no evidence of effusion about the larynx; there was no hemorrhage nor other cause of exhaustion. Stimulating and nutritious enemata were given freely; and the stomach tube, at the suggestion of Dr. Hodge, was procured, with the intention of supporting her by food injected into the stomach; we were, however, deterred from its use by an apprehension lest it should bring on a sudden spasm of the glottis, and cause immediate death. We all saw her repeatedly from this time until Friday morning at 11 o'clock, when she expired.

"The interesting points in this case are the intensity of the arterial excitement, the dysphagia and aphonia, without a corresponding difficulty of respiration, or sufficient swelling and inflammation in those parts of the throat within sight, and commonly affected, to account for these symptoms. It was not laryngitis, nor bronchitis, nor pharyngitis, nor tonsillitis. The examination of the body revealed the whole mystery. Upon opening the trachea and larynx, the traces of inflammation were so slight as hardly to be recognized; and we were disposed at one time to seek the causes of death in the brain, or some other organ. It was, however, determined to remove entirely the pharynx, together with the base of the tongue, in order to look at them carefully from behind; in doing this, an abscess was opened, situate between the œsophagus and the vertebra, containing about half an ounce of purulent matter, and so immediately behind the glottis as to account most satisfactorily for the difficulty of swallowing and dread of strangulation expressed by the patient, from the time the disease first assumed a serious character. There were also minute depositions of pus between the arytenoid and cricoid cartilages, showing the cause of the difficulty of speaking."

Dr. Ashmead communicated the following history of '*a case of death from over-distension of the bowels, producing pressure upon the diaphragm, to such an extent as to prevent respiration.*'

"W. Wyre, aged 40 years, of large robust frame and in full health, was attacked with violent abdominal pain, vomiting and constipation, about three o'clock A. M. on the 27th of August last. At half past three P. M. I saw him; he had then feeble and frequent pulse, shrivelled skin, covered with a cold, clammy sweat; hands and face blue, as in the last stage of Asiatic cholera; respiration short and hurried, abdomen enormously inflated with gas, tense as a drum, and rising high above the level of the sternum. He was suffering under great distress and uneasiness, but had no acute pain. His intellect was perfectly clear. I found on inquiry that the patient had arrived here on the 26th, from England, after a long voyage, during the few last days of which, he had been on short allowance. The night previously to his attack, he had eaten voraciously of watermelon, and drank freely of small-beer and cider just before retiring to bed.

"On first entering the room, and seeing the patient in the condition described, the thought instantly crossed my mind, that here was an obstruction of the bowels, causing immense distension, by which the lungs, heart and blood-vessels were compressed, and their actions impeded; that the patient was actually *moribund*, *asphyxied*, and could only be saved by an immediate evacuation of the gas. Acting, too, on the wise maxim of my estimable preceptor, (the late Dr. Parrish,) always to suspect hernia, in cases of cholic, I at once inquired 'Have you hernia?' The answer was, yes, and on examining, I found a large scrotal hernia on the left side, in a state of strangulation. This was readily reduced, and an injection of spts. terebinth, in water, every five minutes afterwards, brought away a large fluid evacuation, but no flatus. I now attempted to pass a large tube into the bowels, but failed—another enema was given, during the operation of which, the patient, contrary to my positive orders, rose from his bed, and was near fainting from the exertion; he was laid back in bed, and some brandy and spts. of terebinth, given to hasten peristaltic action from above, and to stimulate the general system, which was now still farther prostrated. I stepped aside, with my back toward the patient, to prepare another injection; when in an effort to vomit, he turned upon his abdomen: aware of the imminent danger of this position, I seized him, and turned him over as quickly as possible on the side; but his respiration was now irregular and gasping, and in less than two minutes ceased altogether. In the act of expiring he had a feculent evacuation, from the bowels, with some flatus. During his last moments I proposed tapping the cæcum, an operation which may be done without penetrating the peritoneum; to this the patient consented, but unfortunately no instrument, not even a pen-knife, could be procured, until it was too late.

"The whole time I was with him, was not more than half an hour, and every thing had to be done by myself; could I have had fifteen minutes longer the life of the patient might have been saved.

"August 28th, at half past seven o'clock, A. M., I made an *Autopsy*—corpse less livid than before death—muscles very rigid—lungs crepitated naturally, not inflamed but greatly compressed, and congested with dark blood—Pleura natural—heart natural, containing one and a half ounces coagulated blood—pericardium contained a small quantity of dark-coloured serum—peritoneum of abdominal parietes healthy. Its cavity contained about a quart of dark, bloody serum, with a few albuminus flocculi, floating in the left iliac fossa. Peritoneum of intestines, exhibited slight injection over the stomach, duodenum, and upper half of the jejunum; over the lower portion of the jejunum and the ilium the injection was much higher, approaching to a dark colour, and over the whole of the large intestines, the colour was so dark, that it might have been mistaken for gangrene, had there been any odour, or softening of the structure, which, however, was not apparent. A small portion of coagulable lymph was observed on the portion of the bowels which had been strangulated. Omentum natural, and pushed far up in the hypochondriac region—stomach, liver, spleen and kidneys all healthy; bladder contracted.

"The position of the diaphragm was particularly remarked. The highest point of its *peritoneal surface* (ascertained by thrusting an iron stile, through the chest, perpendicular to the spine), after the removal of the bowels, was, on the right side, *three inches above the nipple*, or half way between the nipple and the lower edge of the clavicle; on the left side *one inch above the nipple*—bowels greatly distended, their mucous membrane throughout of a healthy texture—the duodenum and upper half of the jejunum empty, and compressed together—the lower half of the jejunum and the ilium, greatly distended with gas, and loaded with yellowish fluid fæces, and small pieces of undigested vegetable substance of the size of beans—the distension increased towards the cæcum.

"On passing an iron stile through the abdominal parietes *one inch above, and one inch to the left*, of the anterior superior spine of the ilium, it penetrated the cæcum about an inch *without* the reflection of the peritoneum, from the intestine to the abdominal parietes. This is the point for the performance of the operation, mentioned in the history of the case. On the anterior surface of the ascending colon, two or three inches above the ilio-cæcal valve, its peritoneal coat was lacerated, making a tear two or three inches long, and about one and a half inches wide. The longitudinal band of muscular fibres at this point, was also torn across and retracted, so as to obliterate the pouches which exist at this place. So great was the distension of the cæcum, that on cutting off the ilium two inches above it, a violent gush of fluid fæces and gas took place, attended with a loud noise; the contents of the bowels being propelled to the distance of at least four feet from the body. The ascending, transverse, and descending colon were also enormously distended, the latter passing very high up, into the left hypochondriac region. The distension gradually lessened from the transverse colon downwards. The sigmoid flexure with its meso-colon, were highly injected and ecchymosed, the dark colour terminating above and below in abrupt lines, showing the exact extent of the stricture. The part which had been strictured was attached to the internal abdominal ring by elongated old adhesions. The lower portion of the sigmoid flexure, and the rectum were perfectly natural.

"Dr. Meigs remarked, that he was glad to hear the very interesting communication of Dr. Ashmead, as it confirmed an opinion which he had long held and taught, that death often occurred in puerperal peritonitis from the same cause which produced it in Dr. A.'s case. He thought the use of the tube, in this disease, a matter of great practical importance, and one upon which he had dwelt with emphasis in his work on midwifery. He had frequently known patients to be greatly and suddenly relieved by it, when no other means appeared available.

"It is a well known fact, that inflammation of the serous covering of the intestine, will paralyze its muscular coat, and that then the peristaltic actions will be suspended, hence the great accumulation of flatus which occurs in peritonitis, and the necessity of purgatives to produce muscular contraction, and of a resort to mechanical measures, to relieve distension.

"Dr. Meigs considered the passage of the sigmoid flexure of the colon, to be the chief object in the introduction of the tube; it was here that the main difficulty existed; the muscular bands at this point were in a state of spasm, affording, oftentimes, an insuperable obstruction to the passage of flatus; the moment this spasm is relieved by the introduction of the tube, a violent rush of gas from above takes place, the tympanitis rapidly subsides, and the respiration of the patient becomes free.

"Dr. Meigs enforced these views by a reference to a case of colica pictonum which had fallen under his observation some years since. The patient was a robust man who was violently seized with this disease. When Dr. M. was called he found him cold and nearly pulseless, with enormous distension of the bowels, difficult respiration, hypocratic countenance, and such decided evidences of approaching dissolution, that he considered him moribund, and thought he could not survive fifteen minutes. He determined, however, to attempt his relief by the introduction of a tube into the bowels; he succeeded in passing the sigmoid flexure—a violent rush of gas followed, with immediate relief to the patient. The abdomen fell, the respiration became less oppressed, the pulse revived, and to the surprise of Dr. M. the patient finally recovered. He must have died very speedily had not the escape of flatus been effected."

This is a very interesting contribution to the history of tympanitis, and is calculated to attract attention to the subject. It was long ago known that tympanitis might prove fatal. Merklin (*Ephem. Nat. Curios.* Dec. III. Obs. 141), Heister (*Ibid.* Art. v. Obs. 84), and Morgagni (*De Caus. et Sed.* xxix. Art. 8), each have recorded a case of this character.

Very recently (Sept. 21, 1841), a case of the same kind was communicated to the Acad. of Med. by M. Lasserre, of Agen. The subject was a woman recently delivered, who was doing well for the first eight days, when she eat beans and badly baked bread, which was followed by tympanitis, and in two hours she was a corpse.

In *L'Examinateur Médical,* (14th Nov. 1841,) there is a very interesting memoir on this subject, by the editors MM. Dechambre and Mercier, each of whom relates a fatal case occurring under their own observation, one at Bicêtre, the other at the Salpétriere. Six other cases are also given, collected from different sources.

The operation of paracentesis has been performed with success by Mr. Fine, an eminent surgeon of Geneva. The patient was a female ætat. 70, who after a diarrhœa of four months duration became constipated, a condition which purgatives failed to relieve,—tympanitis supervened. Mr. F. cut into the most prominent part of the abdomen, and retaining the intestine on the surface of the wound by means of a thread, which was passed through the mesentery, and fixed on the sides of the abdomen with adhesive plaster, he opened the intestines and gave passage to a large quantity of fæces; the tympanitis and symptoms of gangrene subsided, and the patient was relieved with the inconvenience of an artificial anus. (Odier, *Manuel de Méd. Prat.* and *Cyclop. Pract. Med.* iv, 358.)

Parecentesis was also resorted to by Brieude, in the case of a girl 16 years of age, who having taken cold at the menstrual period, was suddenly seized with the most violent colic. All the remedies tried for her relief failed, and her abdomen became enormously distended, hard and sonorous on percussion. M. Brieude, seeing no other resource, punctured the abdomen; the moment the trocar was withdrawn the air rushed out and repeatedly extinguished a candle. The abdomen sunk, the pains disappeared and the patient appeared cured. The next day, however, the colic returned, the mother of the patient would not consent to a repetition of the operation, and in a short time death took place. (*Journ. de Méd.*, April, 1799.)

In a case recorded in the *Acta Cur. Nat.* I, Obs. 9, a long needle was plunged into the left hypochrondria as far as the stomach; an operation certainly not likely to give vent to the gas; and it is with justice that Littre (*Mem. Acad. des Sc.*, ann. 1713), and Mothe (*Melanges de Chirurg. et de Med.*), recommend a trocar armed with a long canula. Benjamin Bell also recommends this operation. "To perforate the abdomen for air collected in the intestines," he observes, " is no doubt a very formidable operation, and ought not to be attempted but in cases of the greatest danger; but as death has often resulted from this variety of the disease, and of which I have met with different instances, I am clearly of opinion, when the remedies prescribed by the physician for removing it have failed, that the assistance of surgery should always be desired, rather than allow the patients to die in certain misery. The same remedy is frequently and successfully employed for discharging air collected in the stomach and bowels of other animals; we have much reason therefore, to hope that in the human species the same effects would result from it." (*A System of Surgery*, II, 524, Troy, 1804.)

Before such an extreme measure as puncture is resorted to, other and milder measures should first be tried, and especially the introduction of a long gum-elastic tube into the intestines as mentioned by Dr. Meigs. In some cases it may be sufficient to introduce a short pipe merely through the sphincter ani to take off the resistance of this muscle, as recommended by Dr. Darwin. In most cases, however, a long tube will be required. Trnka (*Historia Tympanitidis*, 4to, 1788), and afterwards Piorry, proposed the removal of the gas by a syringe attached to a long tube introduced as far as possible into the intestines, and the practicability of this measure has been satisfactorily demonstrated by Dr. Osborne in St. Patrick Dun's Hospital. The patient, a female, aged 22, was admitted on the 23d of Jan. 1831, into Dr. Osborne's ward, on account of various hysterical symptoms attended with obstinate constipation; these, although relieved, were followed by tympanitic distension, which produced the greatest distress, and for which the employment of leeches, carminatives, and various other remedies, proved wholly unavailing. It became an object of importance to examine the abdominal viscera, in consequence of some symptoms of doubtful import which at different times had occurred. Dr. Osborne having introduced a gum elastic tube, of nearly three feet in length, with a button and hole at its extremity, and applied to it an air-tight stomach-pump, proceeded to pump out the gas, and was enabled to do so with but few interruptions, which were speedily overcome, either by shifting the place of the tube in the intestine, or by injecting warm water to clear the holes from accidental stoppages. The gas thus extricated was nearly inodorous, and extinguished flame, being most probably entirely carbonic acid. In about an hour the abdomen was reduced to nearly the natural size, with complete relief of the painful distension, and thus an opportunity was afforded of ascertaining that no visceral enlargement had taken place. In passing the tube through the rectum and sigmoid flexure, it was occasionally retarded by folds of the mucous membrane; but was soon freed by injecting warm water, and thus procuring distension at those parts. Very little inconvenience was experienced by the patient, although she felt the end of the tube in the left hypochondrium. The same process was repeated upon her more than once, and with the same effect.

Dr. Osborne remarks, "Portions of the intestines dilated by flatus beyond their power of contraction, resemble the bladder when reduced to a paralytic state in consequence of retention of urine, and cannot contract effectually until a diminution of their contents is first obtained; hence it is probable that this method may not only prove a temporary relief, but may contribute to the permanent removal of many cases of torpidity of the bowels."—(*London Med. Gaz.* VII. 825.)

Dr. Graves mentions in his clinical lectures two cases, in which the same means was successful. The first case occurred in a young gentleman attended by Dr. G. and Mr. M'Dowell. Great distress was experienced from the distension. An œsophagus tube was introduced very high up into the gut, and an immense quantity of wind discharged, to the great relief of the patient, who was so much pleased with the experiment, that he would not let the tube be taken out for nearly three days, and "you could every now and then hear the whizzing of wind through the tube, like air passing into the nozzle of a bellows." In another case, attended by Mr. Kirby, Mr. Cusack, and Dr. Graves, a young surgeon used, every day, to pump out the air, and even brought away matter from the bowels by the last action of the syringe.—*Lon. Med. and Surg. Journ.* Vol. II, p. 781, Jan. 1833.

In some cases, probably, the introduction of a catheter into the stomach through the œsophagus might afford relief; a measure commonly resorted to with success in cattle, when labouring under distension of the stomach in consequence of the sudden extrication of air from green succulent food consumed too greedily.

There are one or two other points of great interest in relation to this affection, particularly the mode in which death is produced in these cases, which we should like to discuss, but our limits compel us, for the present, to close our remarks.

Art. XVI.—*A Physiological and Pathological Inquiry concerning the Physical Characteristics of the Human Teeth and Gums, the Salivary Calculus, the Lips and Tongue, and the Fluids of the Mouth, together with their respective local and constitutional indications.* As read before the American Society of Dental Surgeons, at their Second Annual Meeting, held in Philadelphia, August 11, 1841.—By Chapin A. Harris, M. D., D. D. S., Prof. of Practical Dentistry in the Baltimore College of Dental Surgery, &c. &c. &c. Baltimore: Armstrong and Berry. 1841, 8vo. pp. 119.

The very comprehensive title page of this work fully expresses its design, and we can add that this design is well carried out. The volume is an interesting one to the physiologist and physician, as well as to the practical dentist, and we commend it to their attention.

Art. XVII.—*First Principles of Medicine.*—By Archibald Billing, M. D., A. M., &c. &c. &c. First American from the Fourth London edition, revised and improved. Philadelphia: Lea & Blanchard. 1842, 8vo. pp. 304.

The merits of this very valuable work, were discussed in extenso on a former occasion, (see No. for May, 1839, p. 145,) and it is only necessary, therefore, at present in announcing an American reprint, to refer to our former review, and to add, that the present edition is from a later one than formerly noticed, and contains various additions and improvements. It should be placed in the hands of every student.

ART. XVIII.—*Practical Surgery; with one hundred and fifty Engravings on wood.*—By ROBERT LISTON, Surgeon. Second American from the third London edition. With additional Notes and Illustrations, by GEO. W. NORRIS, one of the Surgeons to the Pennsylvania Hospital. Philadelphia: Thomas, Cowperthwait & Co. 1842, 8vo. pp. 588.

THIS edition of the Practical Surgery of Mr. Liston, merits a still higher meed of praise than we have bestowed (see Nos. for May, 1838, p. 160, and May, 1839, p. 179,) on the previous ones. It is got up in the very best style as to typography and illustrations, and the additions of the author and editor, are extensive and valuable. Mr. Liston has been, we conceive, fortunate, in having so judicious and capable an editor as Dr. Norris.

ART. XIX.—*Medical Lexicon.* A New Dictionary of Medical Science, containing a concise account of the various Subjects and Terms; with the French and other Synonymes, and Formulæ for various Officinal and Empirical Preparations, &c. Third edition greatly modified and enlarged.—By ROBLEY DUNGLISON, M. D., Prof. of Institutes of Medicine, &c. in Jefferson Medical College, &c. &c. &c. &c. Philadelphia: Lea & Blanchard. 1842, 8vo. pp. 749.

THIS edition has been much improved by the incorporation in the body of the work of the synonymes, which in the preceding edition were thrown together in the form of an index. It will doubtless receive the favour which has been extended to the preceding editions.

ART. XX.—*Annual Report of the Board of Trustees of the Massachusetts General Hospital for the year* 1841. Boston: 1842, pp. 36.

FROM this interesting document it appears, that the whole number of patients admitted into the Massachusetts General Hospital the past year was 404; of whom 151 were discharged well; 87 much relieved; 65 relieved; 53 not relieved; 26 died; 3 eloped, and 6 unfit, leaving in the house at the close of the year 48.

In the McLean Asylum, there were on the 1st of January, 1841, 126 patients, admitted during this year 157, making a total of 283 under treatment during the year. Of these, 141 were discharged, leaving 142 in the house. Of those discharged 75 were well; 11 much improved; 13 improved; 29 not improved; 11 dead; 2 unfit.

Dr. Bell, in his very interesting report, expresses some views relative to the "so called statistics of circumstances relating to the insane," which are worthy of attention. "There are but few circumstances," he observes, "touching the history, causes, type or results of the cases of insane persons which are capable of being stated numerically. Of these few, it unfortunately is true, that their importance is almost too insignificant as matters of curiosity or of science, to render their communication of much more value than the fashion of their dress or the aspect of the planets. I presume that the ages of patients, their civil state as married, widowed or single, the colour of the hair and eyes, the complexion and the like, might be recorded and conveyed with a tolerable degree of exactness, but beyond this anything of the ordinary tabular statistics requires so many explanations and qualifications on account of their complexity, uncertainty and changeableness, as to deprive them entirely of the character to which they seem to aspire.

"When it is practicable by any acuteness of sagacity to seize upon, and by any precision of language to express in signs and classify in columns the degree and character of the affective sentiments, the moral qualities and the intellectual capacity of an individual, then we may look for the characteristics and results of insane hospitals in tables of scientific accuracy."

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"A single illustration in this matter of statistics will show how easy it is 'to keep the word of promise to the ear, but break it to the sense.' An eminent English naval officer, in his book of travels in the United States, shows his estimate of the high character of our institutions for the insane, by referring to the statistics of one where the ratio of recoveries is given as $91\frac{7}{8}$ per cent. This statement was doubtless literally accurate. Every work on insanity since issued from the press abroad, comes to us repeating this fact without comment. Will it be credited that this ratio, apparently so precise and minute as to descend to fractional parts, was based on the event of twenty-three cases, discharged in one year, (*recent* cases too, not of a year's but of six months' standing,) twenty-one of which recovered! *Per centages* were deduced from less than a quarter of a *hundred* units."

Art. XXI.—*A System of Practical Medicine, comprised in a Series of Original Dissertations*—Arranged and edited by Alexander Tweedie, M. D., F. R. S. Fellow of the Royal College of Physicians, &c. &c. With Notes and Additions, by W. W. Gerhard, M. D., Lecturer on Clinical Medicine to the University of Pennsylvania, Physician to the Philadelphia Hospital, Blockley, &c. &c. The second American Edition. In three volumes. Philadelphia: Lea and Blanchard. 1842, pp. 655, 627 and 734.

The rapid sale of this work has induced the publishers to print a new edition, which is compressed in three volumes, so as to place it at a price within the reach of every reader. "There is no abridgment or alteration whatever of the text of the former edition," but some very interesting notes have been added. We most fully coincide in the sentiment expressed by the editor, that this work, "embodying as it does the most recent information on nearly every disease, and written by men who have specially devoted themselves to the study of the disorders which form the subject of their articles, is the most valuable for reference within the reach of the practitioner."